Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 113,909 (2012)	1-Jan-2012

Q(β^-)=−1.380×10^4 *5*; S(n)=17876.0 *13*; S(p)=2748.6 *6*; Q(α)=−10461.2 *8* 2012Wa38
Note: Current evaluation has used the following Q record −13795 5017875 1 *2748*.8 *6* −10461.4 *8* 2011AuZZ,2003Au03.
2003Au03: S(n)=17865(3).

Other reaction:
^{27}Al(^{3}He,n): 1969La27.

^{29}P Levels

Cross Reference (XREF) Flags

A	^{29}S β^+ decay	E	^{28}Si(^{3}He,d),(d,n)
B	^{31}Ar β^+2p decay	F	^{31}P(p,t)
C	^{28}Si(p,γ),(p,p′γ),(p,p′) :res	G	^{32}S(p,α),(p,$\alpha\gamma$)
D	^{28}Si(pol p,p′) E=6.4-7.7 keV		

E(level)[†]	J$^\pi$	T$_{1/2}$[h]	XREF	Comments
0	1/2$^+$	4.142 s *15*	ABCDEFG	%ε+%β^+=100 μ=1.2346 *3* J$^\pi$: L=0 in (^{3}He,d) and from ^{29}P($\beta^+\varepsilon$) decay. μ: From 2009Zh53 − β-NMR − diamagnetic correction. Other: 1.2349 *3* (β-NMR − 1971SuZI) also in 2005St24, 2011StZZ and 1989Ra17. T$_{1/2}$: weighted av: 4.19 s *2* (1960Ja12), 4.15 s *3* (1970Sc16), 4.149 s *5* (1973Ta04), 4.083 s *12* (1975Az01), 4.084 s *22* (1980Wi13).
1383.55[‡] *7*	3/2$^+$	151 fs *12*	ABC EFG	J$^\pi$: L=2 in (^{3}He,d), 1383.55γ (M1+E2) to 1/2$^+$. T$_{1/2}$: Other: 146 fs *42* (1970Cu07−(^{3}He,d),(d,n)).
1953.91[#] *17*	5/2$^+$	268 fs *21*	ABC EFG	J$^\pi$: L=2 in (^{3}He,d), 570.36γ (M1+E2) to 3/2$^+$. T$_{1/2}$: Other: 222 fs *90* (1970Cu07−(^{3}He,d),(d,n)).
2422.7[#] *3*	3/2$^+$	19 fs *3*	A C EFG	J$^\pi$: L=2 in (^{3}He,d), 2422.7γ (M1+E2) to 1/2$^+$.
3105.9 *3*	5/2$^+$	23 fs *10*	A C E G	J$^\pi$: L=2 in (^{3}He,d), 1722.4γ (M1+E2) to 3/2$^+$.
3447.6[@] *4*	7/2$^-$	9 fs *6*	C E G	J$^\pi$: L=3 in (^{3}He,d), γ-transitions to 5/2$^+$.
4080.5[#] *3*	7/2$^+$	11 fs *1*	A C EFG	J$^\pi$: L=4 in (p,t), 2126.5γ (M1+E2) to 5/2$^+$, 2696.9γ to 3/2$^+$.
4343.0[#] *20*	3/2$^-$	52 keV *8*	C E G	J$^\pi$: L=1 in (^{3}He,d), 4343γ to 1/2$^+$.
4642.0[&] *6*	(7/2$^+$,9/2$^+$)	35 fs *15*	C FG	J$^\pi$: L=4 in (p,t).
4759[#] *3*	1/2$^+$	15.6 keV *6*	C EFG	J$^\pi$: L=0 in (^{3}He,d).
4954.1 *5*	(5/2$^+$)	<2 keV	A C G	J$^\pi$: 3570.6γ (M1+E2) to 3/2$^+$, 4954γ to 1/2$^+$.
5047 *3*	(7/2$^+$,9/2$^+$)		FG	J$^\pi$: L=4 in (p,t).
5293.0 *5*	(7/2$^+$)	<2 keV	A C FG	J$^\pi$: L=4 in (^{3}He,d).
5527 *20*	1/2$^-$[e]	400 keV *20*	C	
5583 *4*			G	
5716 *4*			G	
5740[a] *3*	7/2$^-$	12.5 keV *7*	C E G	J$^\pi$: L=3 in (^{3}He,d), also in 1974Mc20.
5826 *4*			A G	
5968 *3*	3/2$^+$	9.5 keV *15*	A C E G	J$^\pi$: L=2 in (^{3}He,d).
6191 *5*	3/2$^-$[e]	95 keV *6*	C	
6328 *5*	(1/2,3/2)[e]	73 keV *5*	A C E	XREF: E(6317).
6505 *15*			A C	E(level): From ^{29}S β^+ decay (1979Vi01).
6577 *5*	1/2$^+$[e]	200 keV *20*	C	

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Adopted Levels, Gammas (continued)

^{29}P Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[h]	XREF	Comments
6828 *5*	$(3/2^+,5/2^+)$[e]	4.9 keV *4*	A C	
6956 *10*	$1/2^+$[e]	120 keV *10*	C	
7021 *5*	$(1/2^-,3/2^-)$[e]	100 keV *8*	C	
7148 *10*			A	
7272 *5*	$(5/2^+)$[f]	<3 keV	A C	
7361 *10*			A C	
7456 *5*	$(7/2^-,5/2^-)$[f]	8.4 keV *7*	C	Jπ: L=3 in 1961Be11.
7523 *5*	$(3/2^+)$[f]	7 keV *3*	A C	
7641 *40*	$1/2^+$[e]	165 keV *25*	C	
7755 *5*	$(5/2^+)$[f]	≈2 keV	A C	
7950 *15*	$(1/2^-,3/2^-)$[e]	14 keV *4*	C	
7998 *30*	$(1/2^-,3/2^-)$[e]	125 keV *25*	C	
8106[b] *11*	$(5/2^+)$[f]	36 keV *10*	A C	
8234[c] *9*	$(3/2^+)$[f]	20 keV *4*	A C	
8297 *15*	$(1/2^-,3/2^-)$[e]	≈40 keV	C	
8379 *3*	$(5/2^+)$	0.271 keV *10*	A CD	T=3/2 Jπ: From (pol p,p′) (1992Wi13) and also in 1980AdZM, 1980AdZN. $T_{1/2}$: From (pol p,p′). Others: 0.36 keV 5 (1976Ik03), 0.17 keV 5 (1969Te02).
8432[c] *15*	$(5/2^+)$[f]		A C	
8510 *10*	$(1/2^+)$[e]	36 keV *10*	C	
8532[c] *10*	$(3/2^+,5/2^+)$[e]	25 keV *7*	A C	
8645 *15*		≈10 keV	C	
8693 *30*	$(1/2^+,3/2^+)$[ef]	120 keV *30*	C	
8780 *15*	$(1/2^+)$[e]	14 keV *3*	C	
8810 *30*			A	
8865[c] *12*	$(1/2^+,3/2^+)$[ef]	9 keV *3*	A C	
8915 *15*	$(3/2^+,5/2^+)$[ef]	33 keV *6*	C	
9002 *15*	$(5/2^+,3/2^+)$[f]	≈50 keV	C	
9079 *15*	$(1/2^-,3/2^-)$[e]	23 keV *5*	C	
9118 *40*		≈150 keV	C	
9301 *15*		7 keV *3*	C	
9369 *15*			C	
9389[c] *12*	$(3/2^+)$[f]	13 keV *5*	A C	
9455 *15*	$(1/2^+)$[e]	20 keV *5*	C	
9548	$(1/2^+)$[e]	50 keV *10*	C	
9625	$(1/2^+)$[e]	40 keV *10*	C	
9664[d] *2*	$(1/2^+)$[g]	3.07 keV *5*	CD	XREF: C(9660). $T_{1/2}$: Γ from (pol p,p′).
9743	$(1/2^+)$[e]	6.5 keV *3*	C	T=(3/2)
9760	$(3/2^+,5/2^+)$	7.6 keV *3*	A C	XREF: A(9715).
9773	$(3/2^+,5/2^+)$	7.6 keV *3*	C	
9815	$(3/2^+,5/2^+)$	19.8 keV *10*	C	
9855[c] *30*	$(3/2^+,5/2^+)$	11.7 keV *5*	A C	XREF: C(9871).
10095 *30*			A	T=(3/2)
10490[d] *2*	$(3/2^+)$[g]	0.88 keV *17*	A D	T=3/2 XREF: A(10535). $T_{1/2}$: Γ from (pol p,p′).
11360 *2*	$(5/2^+)$[g]	3.5 keV *5*	D	T=3/2

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Adopted Levels, Gammas (continued)

^{29}P Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[h]	XREF	Comments
11480 *2*	$(5/2^+)$[g]	1.53 keV *12*	D	$T_{1/2}$: Γ from (pol p,p′). T=3/2 $T_{1/2}$: Γ from (pol p,p′).

[†] From (p,γ), except otherwise noted.
[‡] Weighted average of data from (p,γ) in 1974By01, 1973Ba35, 1975Al24, 1969Bi07 and from (p,α) in 1974De27.
[#] Weighted average of data from (p,γ) in 1974By01, 1973Ba35, 1975Al24 and from (p,α) in 1974De27.
[@] Weighted average of data from (p,γ) in 1974By01, 1975Al24 and from (p,α) in 1974De27.
[&] Weighted average of data from (p,γ) in 1975Al24 and from (p,α) in 1974De27.
[a] Weighted average of data from (p,γ) and from (p,α) in 1974De27.
[b] Weighted average of data from (p,γ) and ^{29}S β^+ decay (1979Vi01).
[c] From ^{29}S β^+ decay (1979Vi01).
[d] From ^{28}Si(pol p,p′).
[e] From l values, used for the (p,p′) cross section data or angular distribution fitting in 1959Vo29, 1962Br29, 1961Be11, 1974Ge12.
[f] From 1980AdZM and 1980AdZN.
[g] From (pol p,p′) based on (pol p,p′) cross section data fitting.
[h] From ^{28}Si(p,γ),(p,p′γ),(p,p′):res, except otherwise noted.

γ(^{29}P)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[‡]	Comments
1383.55	$3/2^+$	1383.48	100	0	$1/2^+$	(M1+E2)	−0.14 *1*	B(M1)(W.u.)=0.054 *7*; B(E2)(W.u.)=2.7 *5* δ: Weighted average of −0.15 *2* (1974By01) and −0.17 *2* (1960Ok02).
1953.91	$5/2^+$	570.35	8.7 *11*	1383.55	$3/2^+$	(M1+E2)	+0.04 *6*	B(M1)(W.u.)=0.035 *6*; B(E2)(W.u.)=0.8 *+26−8* δ: From −0.06 *9* (1974By01) and +0.14 *9* (1971Fo02).
		1953.77	100.0 *11*	0	$1/2^+$			
2422.7	$3/2^+$	468.8	4.8 *24*	1953.91	$5/2^+$			
		1039.1	14.3 *24*	1383.55	$3/2^+$	(M1+E2)	−0.15 *14*	B(M1)(W.u.)=0.12 *3*; B(E2)(W.u.)=12 *+23−12*
		2422.5	100 *4*	0	$1/2^+$	(M1+E2)	+0.22 *2*	B(M1)(W.u.)=0.065 *11*; B(E2)(W.u.)=2.6 *7* δ: Weighted average of +0.29 *3* (1974By01), +0.23 *3* (1973Ba35), +0.23 *3* (1971Fo02), and +0.16 *5* (1970La17).
3105.9	$5/2^+$	1151.9	32 *3*	1953.91	$5/2^+$			
		1722.2	100 *3*	1383.55	$3/2^+$	(M1+E2)	−0.25 *2*	B(M1)(W.u.)=0.13 *6*; B(E2)(W.u.)=13 *7*
		3105.5	<3.9	0	$1/2^+$			
3447.6	$7/2^-$	341.7	8 *6*	3105.9	$5/2^+$			
		1493.6	100 *6*	1953.91	$5/2^+$			
4080.5	$7/2^+$	1657.6	8 *4*	2422.7	$3/2^+$			
		2126.3	100 *6*	1953.91	$5/2^+$	(M1+E2)	−0.12 *2*	B(M1)(W.u.)=0.106 *13*; B(E2)(W.u.)=1.6 *6*
		2696.6	85 *6*	1383.55	$3/2^+$			
4343.0	$3/2^-$	2959	9.9 *22*	1383.55	$3/2^+$			
		4342	100.0 *22*	0	$1/2^+$			
4642.0	$(7/2^+,9/2^+)$	561.6	15 *8*	4080.5	$7/2^+$			
		1536.0	<4.6	3105.9	$5/2^+$			

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Adopted Levels, Gammas (continued)

$\gamma(^{29}P)$ (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π
4642.0	$(7/2^+,9/2^+)$	2687.8	100 *8*	1953.91	$5/2^+$
4759	$1/2^+$	2336	5.6 *23*	2422.7	$3/2^+$
		2805	<1.1	1953.91	$5/2^+$
		3375	5.6 *23*	1383.55	$3/2^+$
		4758	100.0 *23*	0	$1/2^+$
4954.1	$(5/2^+)$	1848.1	5.1 *17*	3105.9	$5/2^+$
		2531.2	19 *5*	2422.7	$3/2^+$
		2999.9	27 *5*	1953.91	$5/2^+$
		3570.1	100 *5*	1383.55	$3/2^+$
		4953.2	19 *5*	0	$1/2^+$
5293.0	$(7/2^+)$	2186.9	28 *7*	3105.9	$5/2^+$
		3338.7	100 *7*	1953.91	$5/2^+$
		3908.9	<7.7	1383.55	$3/2^+$
8379	$(5/2^+)$	5956	57 *4*	2422.7	$3/2^+$
		6425	100 *4*	1953.91	$5/2^+$
		6995	28 *4*	1383.55	$3/2^+$

† Calculated from level energy differences, E_i-E_f and recoil energy subtracted, by the evaluator.

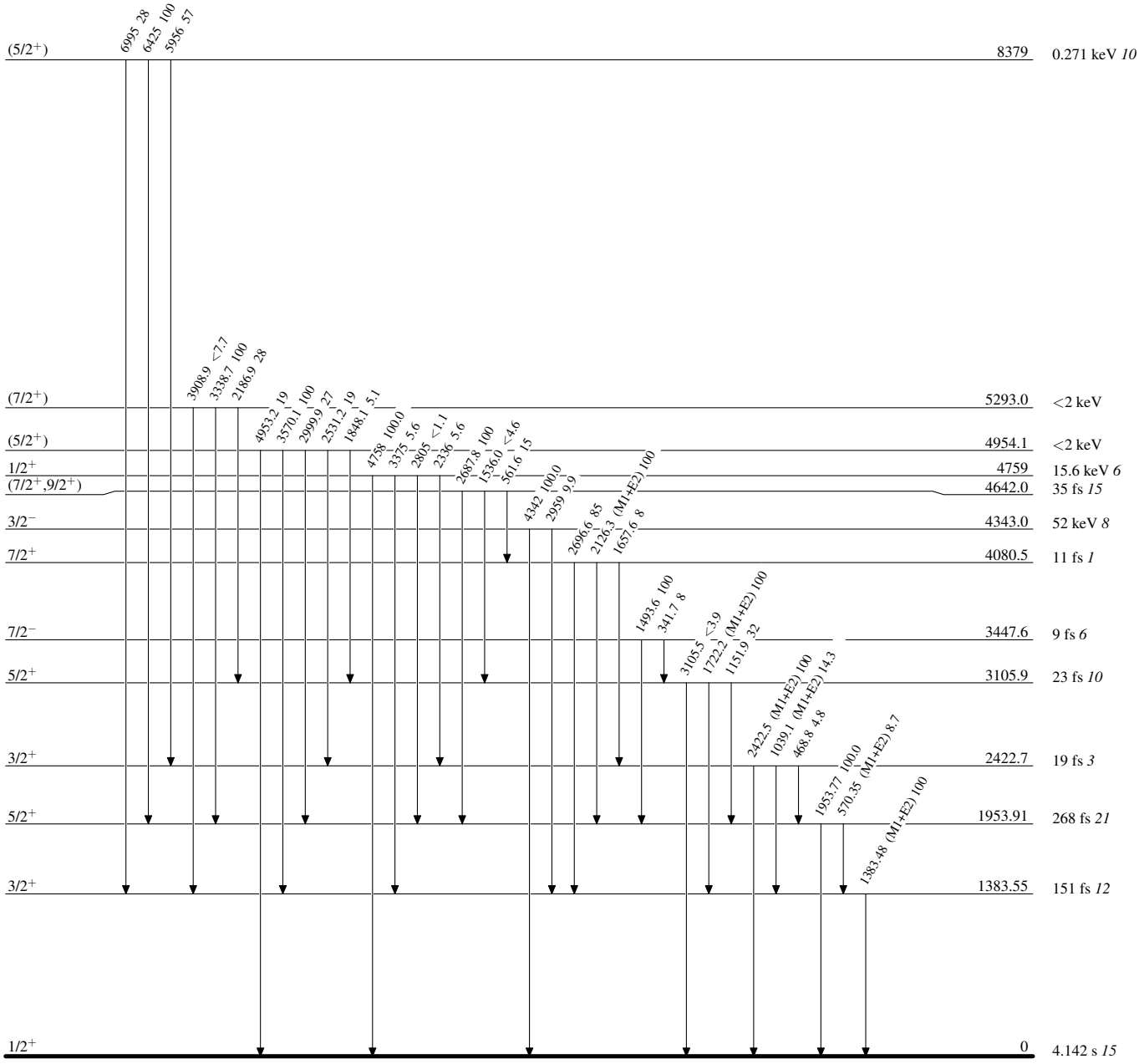
‡ From (p,γ) and (p,α).

Assigned by the evaluator based on the reported mixing ratio data and RUL. In a few cases the calculated value of B(M1)(W.u) are slightly larger by 2 or 3 sigma compared to the RUL.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{29}_{15}P_{14}$